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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SAYOC, EMMANUEL	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/977,552	MILLET ET AL.	
	Examiner	Art Unit	
	Emmanuel Sayoc	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendments and the request for continued examination filed of 7/26/2004. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments. Claims 18-43 are pending and are under current consideration.

Priority

2. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 18-23, 25-40, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6, 471, 486 B1) in view of Culp, III et al. (U.S. 5,975,854), and the applicant's admitted prior art.

With respect to claim 18, 21, 22, 29, 30-40, 42, and 43 in Figure 2A, Centers et al. discloses a compressor system and control system comprising a compressor(s) (1002) and an electronic control system(s) (1004), which is analogous to the claimed invention's control block. The electronic control system (1004) is in communication with the compressor (1002). Multiple compressors (1002) can be controlled at the same time, in which case multiple electronic control systems (1004) are linked via network in a peer to peer configuration – see abstract. A remote computer used for monitoring, controlling, downloading firmware software, and communicating compressor operation data constitutes a system master as in the claimed invention. The remote computer is in communication with the electronic control systems (1004) and is operative to receive and send stored compressor configuration information to and from the electronic control system (1004) – see column 25 line 42 to column 26 line 27. It is obvious that this computer initializes the configuration of the compressor. Random access memory chips (510) are used for storage of operating data, i.e. compressor configuration information, history data, and parameter calculation results – see column 19 lines 33-37. All operating parameters, service information, shut down records, sensor input information (including temperature and pressure data), are transmitted from the electronic control system (1004) to the system master computer. All of the stored operating parameters of the electronic control system (1004) can be modified by the system master computer – see column 15 lines 5-17. The device includes a motor (100), a shell (shown not enumerated), and obviously a compression mechanism in the shell.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block/control system (1004), including a pluggable gateway. As disclosed in column 13 line 65, and column 14 lines 24-28, the control system (1004) includes a network interface connection (2013), among its multiple circuit boards, for connection of the control system (1004), and the compressor to the network, the master computer, and other compressors. This data interface constitutes a gateway board. Having detachable or pluggable interfaces on electronic control devices to accept network or data cables was well known in the art at the time the invention was made. Centers includes a plurality of connectors (J1, J2, J8, J11) and microprocessor boards (500), annunciator boards (600), and ARCnet peer-peer network communication interface circuits, which constitute communication interfaces or gateways.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Center's device substantially discloses the control system of the claimed invention. Each compressor within the Centers et al. control system comprises an individual control block. This control block governs the compressor it is assigned to, and interacts with a system mater and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers et al. device. There is no significant difference between placing all the control blocks into one control room, a control area, by the compressor but not on the compressor, or placing the control blocks on the compressors. Mounting a control block to the compressor it is assigned to would be obvious in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Culp, III et al. teaches a compressor (10) with a terminal box assembly (28). The box contains within a protection module (86), which is analogous to the claimed invention's control box. The protection module, which includes vibration sensors, power supply circuits, and control circuits (Figure 4 and 7), is mounted on the compressor shell via the terminal box (column 6 line 61-62). The protection module (86) may not function the same as that of Centers et al. or the claimed invention, but it nevertheless constitutes a control module or block. The pertinent teaching here is that a control block or module can be mounted to the outer shell of housing of the compressor. Vibration sensors were well known in the art to provide compressor operation and fault diagnostics information. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, and include the vibration sensors, as taught by Culp, III et al., as a functionally equivalent design choice. The applicant's motivation for mounting the control block on the compressor is to integrate the system and reduce connection lines from the control block to the compressor. In a compressor system comprising a system master, multiple control blocks, and multiple compressors, there is a minimum amount of communication lines required to connect all components within the system in a network. Minimizing such communication lines would have been obvious. It is obvious that the compressors have certain positioning constrains. If reducing communication lines were the only consideration then minimizing communication lines would be greatest if the compressors, control block and the system master were bunched together as tight as possible. Obviously this cannot be done and that the compressors have a predetermined layout. Therefore moving two a first component, say the control block, closer to a second component, say a compressor, would

equally make the first component farther from an other component, say another control block on another compressor. No significant communication line is saved. Therefore the mounting of the control block on the compressor, on the grounds of integrating the system and reducing communication lines, is a functional design choice.

With respect to claim 19 and 20, the control system uses pressure and temperature sensors, among others, to detect or predict actual shutdown conditions based on the operating state of the compressor (1002). These signals are transmitted to the system master, and are indicative of an operating characteristic of the compressor – see column 9 lines 21-26.

With respect to claim 23, the stored compressor configuration information includes many compressor specific values such as model number/type – see column 27 line 37.

With respect to claim 25 and 42, the operating data, or configuration information includes at least one pressure limit, and at least one temperature limit. These limits are used as thresholds that predict abnormal compressor operation – see column 9 lines 10-15 (temperature), and column 9 lines 35-40 (pressure). The information also includes at least on time limit – column 17 line 33-38.

With respect to claim 26, the control system (1004) includes a microprocessor (500, Figure 2A-1)

With respect to claims 27 and 28, the microprocessor functions as a gateway for communicating with the system master. The various compressor sensors are connected to the control system (1004) via the microprocessor (500) and in turn to the system master wherein information from the compressors (1002) is communicated to the system master via the control system's (1004) microprocessor (500) – see columns 13 line 55 to column 15 line 57.

With respect to claim 30 and 43, the Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the system master selectively controlling the control blocks/control systems (1004). It is inherent that individual compressors, with their individual control systems (1004), are selectively controlled by the system master over the network. Compressors undergo different compression situations and the system master must be able to provide independent, and appropriate controls to the compressors.

5. In the alternate, claims 18-23, and 25-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al. (U.S. 6, 471, 486 B1), and the applicant's admitted prior art, as applied to structures outlined above, and further in view of Suzuki (U.S. 5,119,466), with respect to the control block mounting.

The Centers et al. device differs from the claimed invention in that there is not explicit teaching of the control block being mounted on the compressor. As stated above the Centers et al. device substantially discloses the control system of the claimed invention. Each compressor within the Centers et al. control system comprises an individual control block. This control block governs the compressor it is assigned to, and interacts with a system mater and other control blocks in a peer-peer system. It is the examiner's position that the exact location of these control blocks does not sufficiently depart from the inventive concept of Centers et al. device. There is no significant difference between placing all the control blocks into one control room, and placing the control blocks on the compressors. Mounting a control block to the compressor it is assigned to would be obvious in order to integrate the design of the compressor, reduce control block to compressor wiring, i.e. network set up, and simplify control block to compressor identification.

Suzuki teaches a motor fan blower (Figure 3) with a control circuit assembly (40), which is analogous to the claimed invention's control box. The control circuit assembly, which includes switches, power supply circuits, and control elements (Figure 5), is mounted on the motor case (34) beneath the shroud (35). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device, by mounting the control block on the compressor, as taught by Suzuki, in order to integrate the design of the compressor, and reduce control block to compressor wiring.

6. Claims 24 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Centers et al., as modified by Culp, III et al., as applied to claim 31 and 35, and in further view of Friedland (U.S. 5,423,190), and Sunaga et al. (U.S. 6,035,661).

Centers et al., as modified by Culp, III et al., sets forth a device as described above, which is substantially analogous to the claimed invention. The Centers et al., as modified by Culp, III et al., device differs from the claimed invention in that there is no disclosure of the electronic control system (1004) containing compressor configuration information including a serial number of the compressor, a refrigerant code for the compressor, and an oil code for the compressor. Compressor information such as the model and serial numbers identify the specific parameters (usually provided by the manufacturer), such as intake pressure, discharge pressure, capacity, voltage/current inputs, or operating temperatures. Specific data, that is critical for control system to maintain optimal operation of the compressor is stored in a memory components (538, see column 20 line 52-67). In the same manner the working fluids, whether it be compressed air, gas, refrigerant, or oil need to be specified such that their thermodynamic properties can be specified for the control system. As seen above, Centers et al. anticipated the

need for specific compressor parameter information. The properties of the compressor and its working fluid have been specified within the control system either directly, or indirectly through other parameters. Friedland in column 2, line 41-51 and column 6 lines 1-10, teaches the use of a compressor serial number to identify the type of refrigerant and amount of refrigerant used. It is common in compressors to use the refrigerant to lubricate the compressor, in which case refrigerant type would constitute the oil type. There are also cases where oil is mixed with the refrigerant, as is taught by Sunaga et al. in Table 4, and Table 5. Each table identifies refrigerant and associated oil. Applying a code to a refrigerant or oil would have been obvious for control scheme identification. Friedland teaches the use of a look-up table. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Centers et al. device by including into the control system (1004) pertinent information such as the compressor serial number, refrigerant code, and oil code, as taught by Friedland and Sunaga et al., for proper identification of the working compressor, its operating fluids, and the thermodynamic properties of its working fluids, using a memory stored look-up table.

Response to Amendment

7. The objection to the title/specification is hereby withdrawn.

Response to Arguments

8. Applicant's arguments, filed 7/26/2004, with respect to the rejection(s) under 35 U.S.C. 103(a), of claims 18-34, primarily in view of Centers et al. and Culp, III et al., and Centers et al. and Suzuki have been fully considered and are not persuasive.

The applicant makes a first argument stating that the Centers et al. device does not contain a system master operable to initially configure the compressor by sending the compressor configuration information to the control block. The examiner sustains the rejection in view of Centers et al. column 15 lines 1-17. The remote PC computer constitutes a system master, which is in communication with control systems (1004), due to that fact that is governs the control of multiple control systems (1004). The control systems (1004) are connected in a network (column 14 line 20-27) for collectively controlling a group of compressors (1002). The reference states that the remote PC accesses compressor information such operations data, maintenance and service diagnosis, operation history, operating parameters, etc. etc. The reference specifically states that the remote PC can modify the stored operating parameters of the electronic control system (1004). Now, what are compressor operating parameters operating? One of ordinary skill would know that these could be any one of motor speed, target inlet or outlet pressure, fluid temperature, fluid flow rate, input current or voltage or power, or anything that constrains or directs the operation of the compressor (1002). It is obvious that by altering these parameters, the remote PC initializes or initially configures the compressor. For example, simply by prescribing an initial current or voltage to the compressor constitutes initially configuring the compressor. Arguing against this would essentially mean that the applicant is stating that in Centers et al., the operating parameters modified by the remote master PC, have nothing to do with operating the compressors. Then what do the operating parameters operate? The claim initialize is very broad given the close nature of the art. In general the examiner recommends narrowing the scope of the claims. The examiner has looked at the specification to

get an idea of exactly what is initialized by the system master. The examiner recommends, without introducing new matter, to specify exactly what, is initialized, and how it is initialized.

Second the applicant submits arguments regarding the gateway. The applicant assumes that the gateway implies more limitations other than a simple communication interface. On page 13 line 10 of the specification the applicant defines gateway to be a communication interface. That is exactly what the examiner was looking for in the prior art. The data and network cables that are known to easily port or plug into network communication/modem boards as stated above constitute pluggable gateways. The examiner agrees with the arguments about the invalidity of using the applicant's disclosure of using the Motorola gateway as a teaching against the applicant's invention. The examiner withdraws all related rejection arguments with respect to the Motorola gateway.

Third, the applicant argues against the motivation of incorporating Culp, III et al. into Centers et al. based on the motivation provided by the applicant. Examiner now asserts that the motivation is simply a non-critical design choice with no unexpected or non-obvious advantages see above.

Finally the applicant argues against the prior art combination teaching of mounting the control block to the compressor. As stated above, the protection module (86) may not function the same as that of Centers et al. or the claimed invention, but it nevertheless constitutes a control module or block. The pertinent teaching here is that a control block or module can be mounted to the outer shell of housing of the compressor. In this rejection the examiner is not arguing that the Culp, III et al. control module functions as the controller of the claimed invention. Centers et al. make that teaching. Culp, III et al. is only cited to make a control block

positioning teaching. The same arguments applies for the Suzuki reference. Applicant is directed to argue against the particular teaching that each reference is cited to teach. Examiner does not claim that each reference teaches the claimed invention, otherwise multiple 35 U.S.C. 102 rejections would have been made. Sunaga et al. and Friedland are incorporated to teach the importance and use of compressor configuration information and parameters. Applicant does not have to argue that these references do not teach the major limitations of the claimed invention. Furthermore the Suzuki fan based on art classification is analogous art.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to compressor control and protection systems.

U.S. Pat. 5, 713, 724 to Centers et al.

U.S. Pat. 4, 502, 842 to Currier et al.

U.S. Pat. 5,641,270 to Sgourakes et al. – teaches programming lookup tables in memory

U.S. Pat. 6,276,901 B1 to Farr et al. – teaches control block on compressor

U.S. Pat. 6,129,527 to Donahoe et al. - teaches control block on compressor

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Sayoc whose telephone number is (703) 305-0054 till 11/15/2004, and (571) 272-4832 after 11/15/2004. The examiner can normally be reached on M-F 8 A.M. - 6 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached (703) 306-2772. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Sayoc
Examiner
Art Unit 3746

CHERYL J. TYLER
PRIMARY EXAMINER

ECS